

Title (en)  
Vacuum toilet system

Title (de)  
Vakuumtoilettensystem

Title (fr)  
Système de toilette à vide

Publication  
**EP 0887478 A2 19981230 (EN)**

Application  
**EP 98102838 A 19980218**

Priority  
US 88054297 A 19970623

Abstract (en)  
A vacuum toilet assembly including a vacuum toilet (11) and a vacuum tank (12) (e.g. a combined holding and vacuum tank) uses a simple air pump (14) to remove air from the tank (12) to create a partial vacuum. The air pump (14) is capable of achieving about ten inches mercury of vacuum in an empty 9.5 gallon vacuum tank in roughly one minute, and can pump at least about one liter of liquid per minute. A combined sound muffler and odor filter (19) and/or rat-tail check valve and noise reducer, is/are connected to the outlet (17) from the air pump (14). The pump (14) comprises a powered reciprocating diaphragm pump having a reciprocating diaphragm (24) powered by an electric motor (28) and oppositely directed first and second disk valves (34, 35). The disk valves have elastomeric disk valve elements die-cut from flat sheets which co-operate with perforated concave surfaces in a dividing wall (38) in the pump housing (14). <IMAGE>

IPC 1-7  
**E03F 1/00**

IPC 8 full level  
**A47K 11/00** (2006.01); **B60R 15/04** (2006.01); **B63B 29/14** (2006.01); **E03F 1/00** (2006.01); **F04B 45/04** (2006.01)

CPC (source: EP US)  
**E03F 1/006** (2013.01 - EP US)

Cited by  
WO02059432A1; US6910231B2; US8381324B2

Designated contracting state (EPC)  
BE DE FR GB IT NL

DOCDB simple family (publication)  
**EP 0887478 A2 19981230; EP 0887478 A3 19991020; EP 0887478 B1 20030507**; AU 6981998 A 19981224; AU 6982098 A 19981224; AU 752014 B2 20020905; AU 752110 B2 20020905; DE 69807787 D1 20021017; DE 69807787 T2 20030206; DE 69814238 D1 20030612; DE 69814238 T2 20040108; DE 887478 T1 20000302; DE 887552 T1 20000302; EP 0887552 A2 19981230; EP 0887552 A3 19991020; EP 0887552 B1 20020911; JP H1162840 A 19990305; JP H1170059 A 19990316; US 6082979 A 20000704

DOCDB simple family (application)  
**EP 98102838 A 19980218**; AU 6981998 A 19980529; AU 6982098 A 19980529; DE 69807787 T 19980218; DE 69814238 T 19980218; DE 98102837 T 19980218; DE 98102838 T 19980218; EP 98102837 A 19980218; JP 16900098 A 19980616; JP 16900398 A 19980616; US 88054297 A 19970623